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Docket No. 95-18A2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Application of:

Thelma G. Manning,
Joseph L. Prezelski,
Sam Moy,
Bernard Strauss,
James Hartwell,
Arpad A. Juhasz,
And
Robert J. Lieb.

Examiner: Unknown at Present

Serial No.: Herewith

Group Art Unit: Unknown at Present

Filed: Herewith

For: HIGH ENERGY THERMOPLASTIC ELASTOMER PROPELLANT

PRELIMINARYAMENDMENT

Honorable Commissioner of Patents and Trademarks,
Washington, D.C. 20231

Dear Sir:

Please cancel Claims 1 to 5.

Please add the following new claims:

6. An extruded propellant material comprising:

a first propellant composition comprising:

an energetic oxetane thermoplastic elastomeric binder comprising from about five percent to about thirty percent by weight, based on the total weight of said first propellant, and chosen from the group consisting of 3,3-bis-azidomethyl-oxetane (BAMO), 3-azidomethyl-3-methyloxetane (AMMO), and combinations thereof, and

a high energy explosive filler comprising from about seventy percent to about ninety-five percent by weight, based on the weight of said first propellant, and chosen from the group consisting of hexanitrohexaazaisowurtzitane (CL-20), 1,3,3-trinitroazetidine (TNAZ), cyclotrimethylene trinitramine (RDX), and combinations thereof,

said first propellant composition having an impetus of at least about thirteen hundred joules per gram (1300 J/g) and a first and relatively slow burn rate measured at 25 kpsi;

a second propellant composition comprising

an energetic oxetane thermoplastic elastomeric binder comprising from about five percent to about thirty percent by weight, based on the total weight of said second propellant, and chosen from the group consisting of 3,3-bis-azidomethyl-oxetane (BAMO), 3-azidomethyl-3-methyloxetane (AMMO), and combinations thereof, and

a high energy explosive filler comprising from about seventy percent to about ninety-five percent by weight, based on the weight of said second propellant, and chosen from the group consisting of hexanitrohexaazaisowurtzitane (CL-20), 1,3,3-trinitroazetidine (TNAZ), cyclotrimethylene trinitramine (RDX), and combinations thereof,

said second propellant composition having an impetus of at least about thirteen hundred joules per gram (1300 J/g) and a second and relatively fast burn rate on the order of at least about three times faster than said first burn rate of said first propellant composition, as measured at 25 kpsi.

7. The propellant composition of claim 6, further comprising an explosive plasticizer comprising from about four percent to about seven percent by weight, based on the weight of said propellant composition, and chosen from the group consisting of 1,3,3-trinitroazetidine (TNAZ), butane-trio-trinitrate (BTTN), trimethylolethane trinitrate (TMETN), triethylene glycol dinitrate (TEGDN), bis,2,2-dinitropropylacetyl/bis2,2-dinitropropylformal (BDNPA/F), methylnitratoethylnitramine (methyl NENA), ethylnitratoethylnitramine (ethyl NENA), and combinations thereof.

8. The propellant composition of claim 6, wherein said second burn rate of said second propellant composition is at least about twenty-one inches per second (21.0 in./sec.) as measured at 25 kpsi.

9. The propellant composition of claim 6, wherein said first burn rate of said first propellant composition is below about five inches per second (5.0 in./sec.) as measured at 25 kpsi.

10. The propellant composition of claim 9, wherein said first burn rate of said first propellant composition is in the range of from about four and four-tenths inches per second (4.4 in./sec.) to about four and five-tenths inches per second (4.5 in./sec.) as measured at 25 kpsi.

11. The propellant composition of claim 6, wherein said second or faster burn rate of said second propellant composition is between about three and five times faster than said first or slower burn rate of said second propellant composition, as measured at 25 kpsi.

12. The propellant composition of claim 11, wherein said second or faster burn rate of said second propellant composition is about four and eight-tenths times faster than said first or slower burn rate of said second propellant composition, as measured at 25 kpsi.

13. A process for the preparation of a propellant composition material, comprising the steps of:

a. preparing a first propellant composition by:

heating an energetic oxetane thermoplastic elastomeric binder comprising from about five percent to about thirty percent by weight, based on the total weight of said first propellant, and chosen from the group consisting of 3,3-bis-azidomethyl-oxetane (BAMO), 3-azidomethyl-3-methyloxetane (AMMO), and combinations thereof, to a temperature of about ninety-five degrees Celsius (95° Celsius) or until said elastomeric binder melts, and

mixing into said elastomeric binder a high energy explosive filler comprising from about seventy percent to about ninety-five percent by weight, based on the weight of said first propellant, and chosen from the group consisting of hexanitrohexaazaisowurtzitane (CL-20), 1,3,3-trinitroazetidine (TNAZ), cyclotrimethylene trinitramine (RDX), and combinations thereof,

to form a first propellant composition having an impetus of at least about thirteen hundred joules per gram (1300 J/g) and a relatively slow burn rate measured at 25 kpsi;

cooling said first propellant composition to a temperature of from about fifty-five degrees Celsius (55° Celsius) to about ninety-one degrees Celsius (91° Celsius) to solidify said first propellant composition;

b. preparing a second propellant composition by:

heating an energetic oxetane thermoplastic elastomeric binder comprising from about five percent to about thirty percent by weight, based on the total weight of said second propellant, and chosen from the group consisting of 3,3-bis-azidomethyl-oxetane (BAMO), 3-azidomethyl-3-methyloxetane (AMMO), and combinations thereof, to a temperature of about ninety-five degrees Celsius (95° Celsius) or until said elastomeric binder melts, and

mixing into said elastomeric binder a high energy explosive filler comprising from about seventy percent to about ninety-five percent by weight, based on the weight of said second propellant, and chosen from the group consisting of hexanitrohexaazaisowurtzitane (CL-20), 1,3,3-trinitroazetidine (TNAZ), cyclotrimethylene trinitramine (RDX), and combinations thereof,

to form a second propellant composition having an impetus of at least about thirteen hundred joules per gram (1300 J/g) and a second and relatively fast burn rate on the order

of about three times faster than said first burn rate of said first propellant composition as measured at 25 kpsi;

cooling said second propellant composition to a temperature of from about fifty-five degrees Celsius (55° Celsius) to about ninety-one degrees Celsius (91° Celsius) to solidify said second propellant composition;

c. mixing said first propellant composition and said second propellant composition, and extruding the mixture in a desired form.

14. An extruded propellant material prepared by the method of:

a. preparing a first propellant composition by:

heating an energetic oxetane thermoplastic elastomeric binder comprising from about five percent to about thirty percent by weight, based on the total weight of said first propellant, and chosen from the group consisting of 3,3-bis-azidomethyl-oxetane (BAMO), 3-azidomethyl-3-methyloxetane (AMMO), and combinations thereof, to a temperature of about ninety-five degrees Celsius (95° Celsius) or until said elastomeric binder melts, and

mixing into said elastomeric binder a high energy explosive filler comprising from about seventy percent to about ninety-five percent by weight, based on the weight of said first propellant, and chosen from the group consisting of hexanitrohexaazaisowurtzitane (CL-20), 1,3,3-trinitroazetidine (TNAZ), cyclotrimethylene trinitramine (RDX), and combinations thereof,

to form a first propellant composition having an impetus of at least about thirteen hundred joules per gram (1300 J/g) and a first and relatively slow burn rate measured at 25 kpsi;

cooling said first propellant composition to a temperature of from about fifty-five degrees Celsius (55° Celsius) to about ninety-one degrees Celsius (91° Celsius) to solidify said first propellant composition;

b. preparing a second propellant composition by:

heating an energetic oxetane thermoplastic elastomeric binder comprising from about five percent to about thirty percent by weight, based on the total weight of said second propellant, and chosen from the group consisting of 3,3-bis-azidomethyl-oxetane (BAMO), 3-azidomethyl-3-methyloxetane (AMMO), and combinations thereof, to a temperature of about ninety-five degrees Celsius (95° Celsius) or until said elastomeric binder melts, and

mixing into said elastomeric binder a high energy explosive filler comprising from about seventy percent to about ninety-five percent by weight, based on the weight

of said second propellant, and chosen from the group consisting of hexanitrohexaazaisowurtzitane (CL-20), 1,3,3-trinitroazetidine (TNAZ), cyclotrimethylene trinitramine (RDX), and combinations thereof,

to form a second propellant composition having an impetus of at least about thirteen hundred joules per gram (1300 J/g) and a second and relatively fast burn rate on the order of about three times faster than said first burn rate of said first propellant composition, as measured at 25 kpsi;

cooling said second propellant composition to a temperature of from about fifty-five degrees Celsius (55° Celsius) to about ninety-one degrees Celsius (91° Celsius) to solidify said second propellant composition;

c. mixing said first propellant composition and said second propellant composition, and extruding the mixture in a desired form.

15. The propellant composition of claim 14, further comprising an explosive plasticizer comprising from about four percent to about seven percent by weight, based on the weight of said propellant composition, and chosen from the group consisting of 1,3,3-trinitroazetidine (TNAZ), butane-trio-trinitrate (BTTN), trimethylolethane trinitrate (TMETN), triethylene glycol dinitrate (TEGDN), bis,2,2-dinitropropylacetyl/bis2,2-dinitropropylformal (BDNPA/F), methylnitratoethylnitramine (methyl NENA), ethylnitratoethylnitramine (ethyl NENA), and combinations thereof.

REMARKS

The claims are 6 to 15. Former claims 1 to 5 have been cancelled in favor of newly presented claims 6 to 15 in order to point out with greater particularity and claim more distinctly the subject matter which the applicants regard as their invention. It is submitted that the subject matter of the cancelled claims has been carried forward and that no new matter as been introduced. It is further submitted that the newly presented claims have been drafted directly from the Specification and Claims of the present Application as filed, and all limitations of the newly-presented claims may be found therein.

In the parent application, the claims were rejected under 35 U.S.C. § 103 (a) as being unpatentable over Unites States Patent 5,210,153 to Manser and Miller in view of United States Patent 5,587,553 to Braithwaite, Lund, and Wardle, United States Patent 5,529,649 to Lund, Highsmith, Braithwaite, and Wardle, and United States Patents 5,690,868 and 5,716,557 to Strauss, Manning, Prezelski and Moy. It is the Examiner's position that the Manser and Miller reference teaches the basic invention, and that it would be obvious to substitute similar fillers as taught by the other references cited.